

SEPARATION OF NUCLEOTIDES AND DNA FRAGMENTS BY CAPILLARY ELECTROPHORESIS USING WALL COATED CAPILLARIES.

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Capillary electrophoresis (CE) can be used to separate nucleotides and DNA fragments by using a capillary coated with Poly(diallyldimethyl-ammonium chloride) (PDADMAC). By coating the inside wall of the capillary with this cationic polymer a thin surface coating establishes a stable anodic electroosmotic flow. A simple capillary coating procedure was developed which consists of treating a new capillary by rinsing for 2 minutes with each of the following 0.1 M NaOH, purified water, 0.5% solution of PDADMAC and the background electrolyte (BGE) solution. This series of capillary rinses is adequate to provide a PDADMAC coating that has a wide pH range and can be used with simple BGE. A simpler BGE gives the potential for easier interfacing of CE instruments to more sensitive detectors like mass spectrometers and it also makes for a simpler analyte recovery after the separation. A systematic study of experimental parameters was done on synthetic mixtures of nucleic acids and DNA fragments to determine the optimum conditions for electrolyte concentration, pH and a suitable buffer for the BGE. Excellent separation of a mixture of four nucleotides in under 6 minutes were achieved. Electropherograms showing the separation attained for six DNA fragments from a sample of lambda DNA Ecor I Markers using PDADMAC coated columns will be shown.